

# **JAKO SCAN**

## **Diagnostic Scanner**



# **USER'S MANUAL**

Version 7.2

## JAKO SCAN

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### **1.0 Introduction**

JAKO SCAN is a diagnostic scanner which works on Japanese (Toyota, Honda, Nissan and Mitsubishi) and Korean (Hyundai and Kia) made vehicles.

It performs the following functions:

- Read Diagnostic Trouble Codes (DTC)
- Erase DTC
- Read Current Data stream
- Activation Test (Unit Test)

Unlike many other scanners, JAKO SCAN operates on an embedded operating system which uses internal Flash Memory instead of cartridges to store the car programs. This eliminates the hassle of changing and keeping a wide selection of program cartridges.

The unit is power up through the Diagnostic Link Connector (DLC) most of the time but some older car models where there was no power supplied then it needs to be powered through the cigarette lighter adaptor which is provided.

## 2.0 Safety Precautions:

**To prevent accidents that could possibly result in serious injury and/or damage to vehicles and/or test equipment, carefully follow all safety rules and test procedures when working on vehicles.**



When the engine is running, it produces carbon monoxide, a toxic and poisonous gas. Always operate the vehicle in a well ventilated area. Do not breathe exhaust gases – they are hazardous that can lead to death.



To protect your eyes from propellant object as well as caustic liquids, always wear safety eye protection.



Fuel and battery vapors are highly flammable. **DO NOT SMOKE NEAR THE VEHICLE DURING TESTING.**



When engine is running, many parts (such as pulleys, coolant fan, belts, etc) turn at high speed. To avoid serious injury, always be alert and keep a safe distance from these parts.



Before starting the engine for testing or trouble shooting, always make sure the **parking brakes is firmly engaged**. Put the transmission in **Park** (automatic transmission) and **Neutral** (manual transmission).



Always block the drive wheels.  
Never leave vehicle unattended while testing.

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Never lay tools on vehicle battery. You may short the terminals together causing harm to yourself, the tools or the battery.



Connecting or disconnecting the test equipment when the ignition is ON can cause damage to the vehicle electrical components. Always turn ignition OFF before connecting or disconnect the Scanner from the DLC.



Engine parts become very hot when engine is running. To prevent severe burns, avoid contact with hot engine parts.



Do not wear loose clothing or jewelry while working on engine. Loose clothing can get caught in fan, pulleys, belts, etc. Jewelry can conduct current and can cause severe burns if comes in contact between power source and ground.



When the engine is running, be cautious when working around the ignition coil, distributor cap, ignition wires and spark plugs. They are HIGH VOLTAGE components that can cause electrical Shock.



Always keep a fire extinguisher readily available and easily accessible in the workshop.

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### **Important Note:**

Some vehicles are equipped with SRS (Airbags). Caution must be taken when working around the air bag components or wiring. Always refer to the vehicle service manuals on the **CAUTION** remarks. If the cautions are not followed, the air bag may open up unexpectedly resulting in personal injury. Note that the air bag can still open up several minutes after the ignition key is off or even the vehicle battery is disconnected because of a special energy reserve module.

Always follow the vehicle manufacturer's warnings, cautions and service procedures.

### **Please take note of these important points:**

Diagnostic Trouble Code (DTC) warns us of a problem or symptom has occurred with a particular engine system, not a specific part.

The vehicle computer can only report Diagnostic Trouble Code (DTC) based on what its sensors had relayed to it.

There are some instances that sensors appeared to be bad when in actual fact, they are not.

The main causes were:

- Poor connections at the connector, broken wire or short circuit may prevent the sensor signal from reaching the vehicle computer.
- Failure of one system may affect the sensor in another system to give false results.

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It is recommended that use of the vehicle service manual to assist in the diagnosing process is important.

The next step in diagnostic process is to test the systems and parts that are suspected to be defective.

Once the faults had been identified and repaired, you can use the JAKO Scan to erase the codes from the computer memory. This will turn off the Malfunction Indicator Lamp (MIL) or Check Engine Light.

### **3.0 Diagnostic Link Connector Locations:**

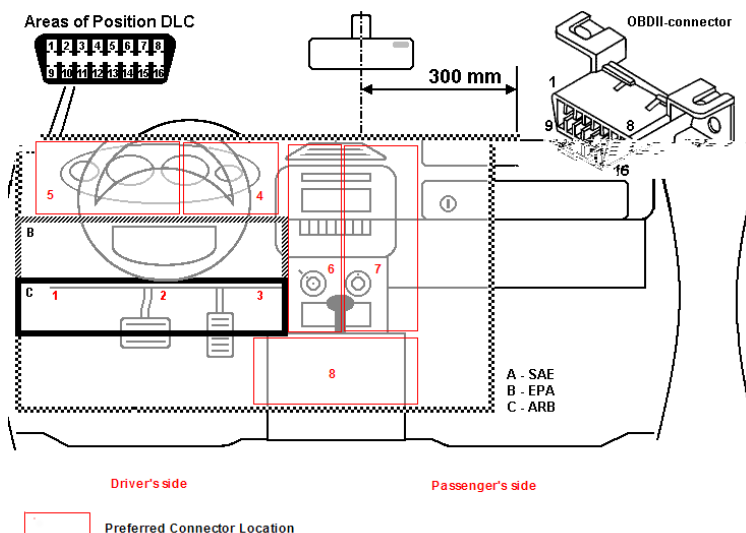
JAKO SCAN communicates with the vehicle's computer modules through the Diagnostic Link Connector (DLC).

There are many types of Diagnostic Link Connectors (DLC), as different car manufacturers use different types. The connectors come together with JAKO Scan are equipped to suit individual car make and also has a common OBDII connector.

It was not until after 1996 that most of the car manufacturers have adapted to standardize the use of OBDII - J1962 connector - Society of American Engineers (SAE) specifications, which had standardized that all vehicles sold in AMERICA should be OBDII compliant.

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The J1962 specification defines the location of the DLC in the vehicle. See diagram below:



Explanation of Diagram Numbered Locations

Location #	Description
1	Driver's side, underneath dashboard, in the area under the steering column, +/- 150 mm (i.e., +/- 6 inches on either side of the steering column)
2	Driver's side, underneath dashboard, between the driver-side door and steering column area
3	Driver's side, underneath dashboard, between the steering column area and the center console (also includes connectors on the driver side but connected to the center console)
4	Driver's side, dashboard instrument/gauge area, between the steering column and center console
5	Driver's side, dashboard instrument/gauge area, between the driver-side door and steering column
6	Center console, vertical surface (i.e., near radio and climate controls), left of vehicle centerline
6/7	Center console, vertical surface (i.e., near radio and climate controls), on vehicle centerline
7	Center console, vertical surface right of vehicle centerline or on passenger side of center console
8	Center console, horizontal surface (i.e., armrest, handbrake area), in front passenger area
9	Any location other than locations # 1-8 (i.e., rear passenger area, passenger side glove box, top of dashboard near windshield)

**\*Note:**

- Locations #1-3 represent preferable locations, Locations #4-8 represent allowable locations under SAE J1962
- Connectors in location # 6, #6/7, and #7 may be covered by ashtrays, covers, cup holders, coin holders, etc.

Figure 1



## **4.0 Diagnostic Trouble Codes (DTC)**

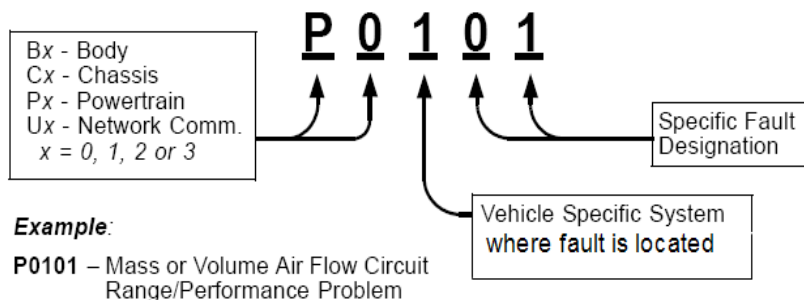
Diagnostic Trouble Codes are how OBDII identifies and communicates to you with the on board computer. When the computer recognizes and identifies a problem, a DTC for the fault is stored in its memory. These codes are intended to help the user to determine the root cause of the problem.

These OBDII DTC codes are made up of:

- The 1<sup>st</sup> character in the DTC indicates a letter which identifies the “main system” where the fault occurred (Powertrain, Body, Chassis or Network)
- The 2<sup>nd</sup> character is a numerical digit which identifies “Generic or Manufacturer Specific”
- The 3<sup>rd</sup> character is also a numerical digit which identifies the specific systems or sub-systems where the problem is located.
- The 4<sup>th</sup> and 5<sup>th</sup> characters are also numerical digits which identifies the section of the system that is malfunctioning.

## OBDII DTC ANALYSIS EXAMPLE:

### SAE J2012 OBD II DTC Recommended Standard



#### Powertrain Codes

- P0xxx** - Generic (SAE)
- P1xxx** - Manufacturer Specific
- P2xxx** - Generic (SAE)
- P30xx-P33xx** - Manufacturer Specific
- P34xx-P39xx** - Generic (SAE)

#### Chassis Codes

- C0xxx** - Generic (SAE)
- C1xxx** - Manufacturer Specific
- C2xxx** - Manufacturer Specific
- C3xxx** - Generic (SAE)

#### Body Codes

- B0xxx** - Generic (SAE)
- B1xxx** - Manufacturer Specific
- B2xxx** - Manufacturer Specific
- B3xxx** - Generic (SAE)

#### Network Communication Codes

- U0xxx** - Generic (SAE)
- U1xxx** - Manufacturer Specific
- U2xxx** - Manufacturer Specific
- U3xxx** - Generic (SAE)

#### Vehicle Specific System where fault is located

1. Fuel and Air Metering
2. Fuel and Metering (injector circuit malfunction only)
3. Ignition System or Misfire
4. Auxillary Emission Control System
5. Vehicle Speed Control and Idle Control System
6. Computer Output Circuits
7. Transmission
8. Transmission.

## 5.0 Malfunction Indicator Lamp (MIL)

When the vehicle on board computer detects a problem in the emission related systems or components, its diagnostic program will assign a fault code (DTC) and save it in its memory and set the malfunction indicator lamp (MIL) alight. Some faults require detection for two trips in a row before the MIL is turned on.

Three typical examples of MIL are shown below:



Figure 2

## 6.0 Definition of Trip

'A Trip' is define as a Key-ON, Key-OFF event in which the powertrain control module (PCM) detects the following:

- Engine coolant temperature should exceed 70°C
- Engine coolant temperature should change more than 20°C after starting the engine.
- Engine speed should go over 400 RPM.

When the powertain control module (PCM) detects a fault during the 1<sup>st</sup> trip, the DTC and the corresponding 'Freeze Frame' data are stored in the PCM's memory. The MIL will not light up until the fault is again detected during the 2<sup>nd</sup> trip. Certain DTCs are capable of turning the MIL on or blinking during the first trip.

## 7.0 Controls and Indicators

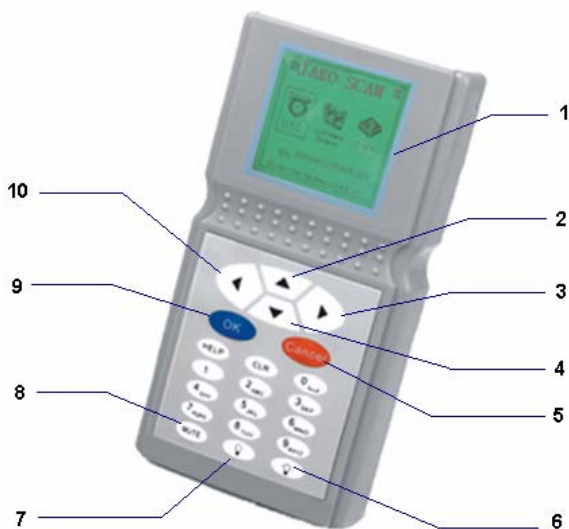


Figure 3

### Descriptions:

**1. LCD Screen**

This 160 x 160 pixels LCD screen displays all the information relevant to the selected function during operation.

**2. ▲ Button**

When this button is pressed once, it will scroll **UP** to the previous row.

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3. **▶ Button**

When this button is pressed once, it will turn to the next page if there is continuation of the text.

4. **▼ Button**

When this button is pressed once, it will scroll down to the bottom row.

5.



This button also acts as "EXIT" button. When pressed once, it will return to the previous screen.

6.



To increase the LCD brightness, press and hold this button will change the screen to brighter contrast.

7.



To decrease the LCD brightness, press and hold this button will change the screen to darker contrast.

8.



When this button is pressed once, it will turn OFF the speaker sound totally.

9.



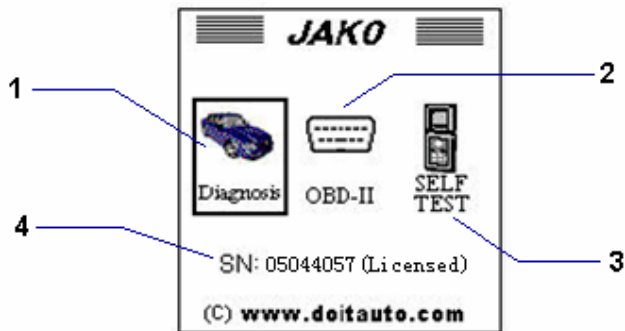
Pressing this button will confirm the selected function.

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### 10. ◀ Button


When this button is pressed once, it will return to the former screen display.

## 8.0 Display Functions



Once JAKO SCAN is powered up, the screen will wake up and display as above.

### 1. **Diagnosis Icon**

Selecting this function by pressing  button will enter the diagnostic program.

### 2. **OBDII Icon**


To select this function, press ▶ button once and the OBDII Icon will be boxed.

Press  button to enter.

Once entered, the menu will be shown.

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### **3. Self Test Icon**

Select this function by pressing  button until the icon is boxed. This function will enter into self test program.

### **4. Serial Numbers Display**

The serial numbers of the scanner unit will be displayed here.

## **9.0 Getting Started**

JAKO SCAN aids in diagnosing and monitoring electronic and emissions related faults in the vehicle and retrieving fault codes related to malfunction in these systems.

Mechanical problems such as low oil level or damaged hoses, wiring or electrical connections can cause poor engine performance and may also cause a fault code to set.

Fix any known mechanical problems before performing any test.

The following Areas need to be checked before starting any test:

The levels of engine oil, power steering fluid, transmission fluid (if auto transmission), engine coolant and other fluids must be at proper level. Top up if necessary.

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Check the condition of air hoses and the air filter must be cleaned. Replace if necessary.

Make sure the timing belts are in good conditions and properly tensioned.

Make sure the spark plugs are cleaned and in good condition. Check for loose, damaged, disconnected or missing plug cables.

Make sure that all mechanical linkages to the engine sensors (throttle, gearshift position, transmission, etc) are secure and properly connected. Refer to Service Manuals for locations.

Check all electrical wirings and harnesses for proper connections and condition of its insulation.

Check all rubber hoses (radiator) and steel hoses (vacuum and fuel) for leaks, cracks, blockage or other damages.

Make sure the engine is mechanically sound. Do a compression check, engine vacuum check, timing check, etc.

Always refer to the manufacturer's Service Manual if you are not sure of the repair procedures.



## 10.0 Operation

When everything had been confirmed and checked as mentioned in **10.0 Getting Started**, the testing operation can be carried out.

1. Turn the ignition OFF.



Figure 4

2. Locate the vehicle Diagnostic Link Connector (DLC) which is usually located under the instrument panel (dash board), within 300 mm of the center of panel, on the driver's side of most cars (**Refer DLC Locations on page 8**). It should be easily accessible and visible from a kneeling position outside the vehicle with the door open. Some European and Asian vehicles have the DLC located on the far left corner of the dash or behind the Ashtray (the ashtray must be removed to access it). If the DLC cannot be located, refer to the vehicle's service manual.

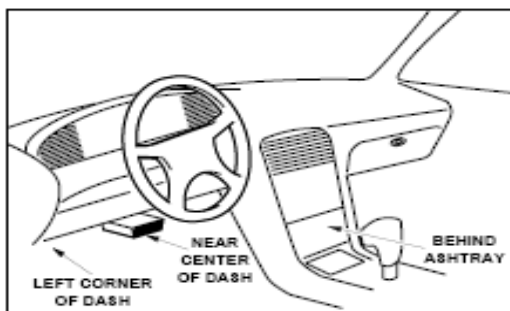


Figure 5

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3. Once the DLC has been located, connect the JAKO SCAN main test cable with the relevant diagnostic connector to the vehicle's DLC.

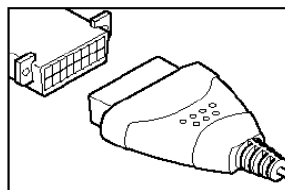


Figure 6

4. Turn the ignition ON and START the engine.



Figure 7

5. When the connection has been established, JAKO SCAN LCD screen will light up and it will display as shown:



Figure 8

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6. Press **OK** button will enter the diagnostic program which shows the Menu as below:



Figure 9

7. Now you can press ▼ or ▲ button to select the which country vehicle manufacturer and then confirm by pressing **OK** button to enter.

For Example: If **JAPAN** is selected and pressed OK button to enter, the display will show the MENU as below:

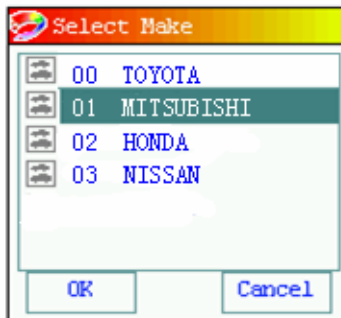


Figure 10

## JAKO SCAN


8. Here you can select the car make by pressing ▼ button, the bar will straight away highlight "MITSUBISHI" the selected manufacturer.
9. In this example, we stick to **MITSUBISHI** and once confirmed with  button, the Menu will show the car models.






Figure 11

10. To view the rest of the car models, press ▼ button until it reaches the end (noticed that the scroll bar on the right also indicates).



Figure 12

## JAKO SCAN

11. If at this instant, you wish to return to the previous page just press  button. The page will display as in Figure 11.
12. As an example to select **00 MONTERO**, press  button until the highlight bar is on this model then press  button to enter the program.

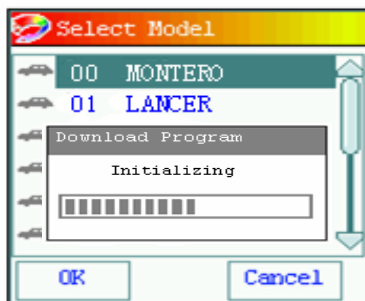


Figure 13

13. Once the initialization has finished, the screen will display the MENU as follows:

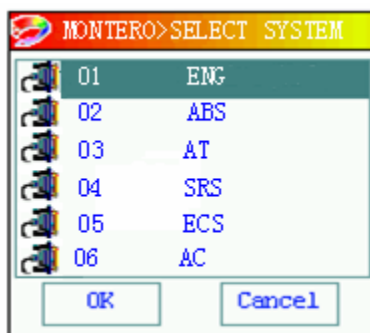



Figure 14

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14. Select the system you want to enter and press  button and the JAKO Scan will start communicating with the engine ECU as shown below:

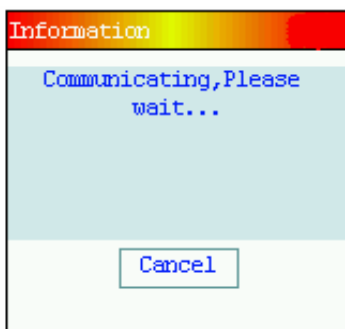


Figure 15

15. Once the communication has established, the screen will display various testing functions depending on the system that has been selected. For instance, ENG was selected and entered; the display will show as below:

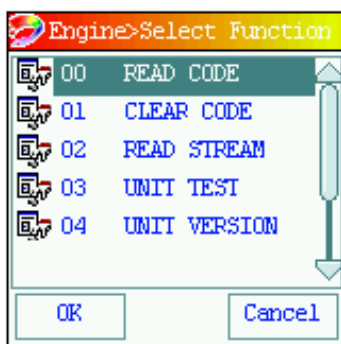



Figure 16

## JAKO SCAN

16. Select the function you desired and press  button and follow the instructions given on the display.

### 11.0 Function descriptions:

#### 00 READ CODES

This function when selected will retrieve the stored Diagnostic Trouble Code (DTC) from the vehicle computer systems memory and displayed it on the LCD screen. The definition of the DTC is also displayed together. If there is no fault code found it will display as follows:

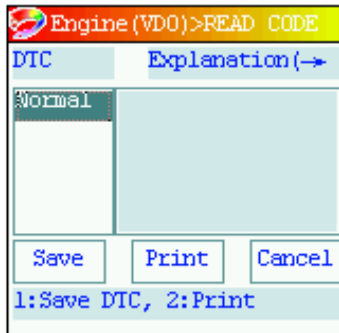


Figure 17

#### 01 CLEAR CODE (DTC)

This function is to erase or clear the Diagnostic Trouble Code (DTC) from the vehicle computer system memory and also the "CHECK ENGINE" light after the problem has been rectified (Figure 18).

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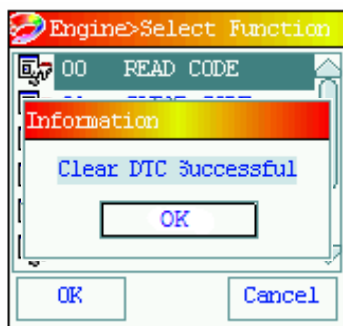



Figure 18

The above shows that the DTC has been successfully cleared. Press  button will return to the Menu.

### 02 READ STREAM

When this function has been selected, it will display all the current Data Streams of the vehicle showing the live value readings of the sensors, temperature, etc.

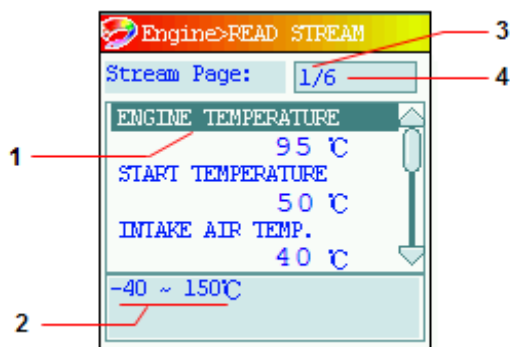



Figure 19



## JAKO SCAN

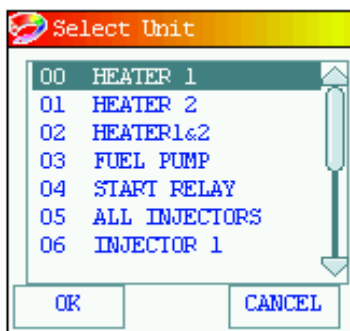
Referring to the READ STREAM screen display (Figure 19), it indicates the followings:

1. The highlighted bar on “Engine Temperature” display the currently selected item. To select the rest, press ▼ or ▲ button.
2. The reference data (SPECIFICATION) of the selected item is displayed here if available.
3. Here indicates the current Data Stream Page number.
4. Indicates the total number of Data Stream Page. To proceed to the next page, press ► button. Likewise to go back, press ◀ button.

To exit the Stream Page, press  button once and it will return to “Select Function” page (Figure 16).

### **03 UNIT TEST**

This unit test also known as activation test is to test the functionality of the electrical components in the vehicle e.g. injectors, fuel pumps, heaters, fans, etc.



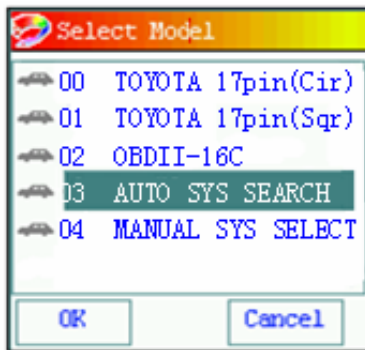
**Figure 20**

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### **04 UNIT VERSION**

This function is to check the vehicle computer system version (type).

## **12.0 TOYOTA – AUTO SYS SEARCH**



**Figure 21**

This function is used when either the 17pins (Circular) or 17pins (Square) fails to detect the ECU. During the process, the scanner will scan through its program and once detected it will display the type: **ENG & A/T-I** or **ENG& A/T-II** or **ENG & A/T-III**. With this information, proceed to **MANUAL SYS SELECT**.

## 13.0 TOYOTA – MANUAL SYS SELECT

Basing on the ENGINE type information results from AUTO SYS SEARCH, select “MANUAL SYS SELECT” to enter into the diagnosis program. Once entered, the display will show:

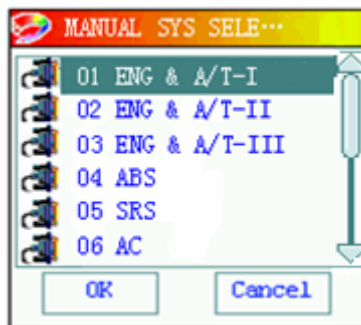



Figure 22

Select the ENGINE type and press  button, the program will to communicate with the vehicle ECU.

## 14.0 Check Hardware

The scanner is equipped with a self test program to check the condition of the hardware. To enter into this program, first you have to go to the Select Menu (Figure 10) and select **03 CHECK HARDWARE** by scrolling down the highlight bar using the ▼ button.

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Press **OK** button to enter. Once entered the display will prompt you a warning message as shown:



Figure 23

When everything has been confirmed that the scanner is not connected to the vehicle DLC, then pressing **OK** button **twice** will proceed with the test as shown.

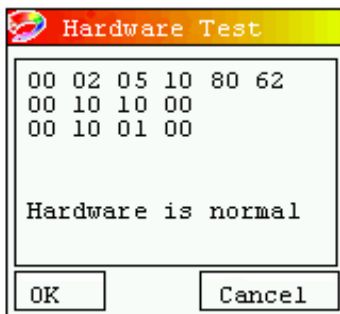


Figure 24

## 15.0 Troubleshooting Guide

### **Fault:**

- JAKO SCAN LCD screen does not light up when the main cable was connected to the vehicle DLC connector.

### **Action:**

- Turn ignition key ON.
- Check DLC connector for loose or damaged pins.
- Check screen brightness control. Turn brightness down.
- Disconnect DLC cable from vehicle and use alternate power source to verify. If OK, replace the main cable. If not, replace fuse.
- Check the vehicle battery power with Multi-meter. If voltage, replace battery.
- If all failed, contact your supplier.

### **Fault:**

- No communication – Turn ignition OFF and then ON again.  
Displayed and never clear.

### **Action:**

- Check DLC connector for loose or damaged pins.
- Disconnect and reconnect the main cable from JAKO SCAN.
- Exit to the Main Menu and enter the program again.
- Ensure the Car Model is selected correctly and enter again.
- If all fails, contact your supplier.

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**Fault:**

- Check MAC code message

**Action:**

- Try entering program again. If still persist contact your supplier.

## **16.0 Disclaimer**

All information, illustrations, and specifications contained in this user manual are based on the latest information available at the time of printing. The right is reserved to make any changes at any time without obligation to notify any person or organization of such revisions or changes.

Furthermore, the manufacturer or its sales agents are not liable for errors contained herein or for incidental or consequential damages (including lost profits) in connection with the furnishing, performance or use of this material.

This user manual tells how to use JAKO SCAN to perform the required procedures on vehicles. Safe and effective use of this scanner is very much dependant on the user following the normal practices and procedures outline in this manual.

## **17.0 Limited Warranty**

This limited warranty cover defects in materials and workmanship for a period of twelve (12) months which begins from the date the product is purchased by the end user and is subjected to the following terms and conditions:

1. Within the warranty period, the manufacturer will repair or replace, at their options, any defective parts and return to the owner in good working condition.
2. Any repaired or replaced parts will be warranted for the balance of the original warranty or three months (3) months from the date of repair, whichever is longer.
3. This warranty only extends to the first owner and not assignable or transferable to any subsequent owner.
4. Cost of delivery charges incurred for the repair of the product to and from the manufacturer will be borne by the owner.
5. This limited warranty covers only those defects that arises as a result of normal use and does not cover those that arises as a result of:
  - Unauthorized modifications and repair.
  - Improper operation or misuse.
  - Accident or neglect such as dropping the unit onto hard surfaces.

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- Contact with water, rain or extreme humidity.
- Contact with extreme heat.
- Cables that have broken, bent contact pins or subject to extreme stress or wear.
- Physical damage to the product surface including scratches, cracks or other damage to the display screen or other externally exposed parts.

### **18.0 Limitations of Warranty**

Other than the foregoing limited warranty, the manufacturer does not make any other warranty or condition of any kind, whether express or implied.

Any implied warranty of merchantability, or fitness for use shall be limited to the duration of the foregoing limited warranty.

Otherwise, the foregoing limited warranty is the owner's sole and exclusive remedy and is in lieu of all other warranties whether express or implied.

The manufacturer or any of its exclusive sales agents shall not be liable for any consequential or incidental damages or losses arising of the loss of uses of this product.

All warranty information, product features and specifications are subjected to change without prior notice.